CLAIMS

1. A method for manufacturing a chip electronic component-mounted ceramic substrate, comprising the steps of:

mounting a chip electronic component including a ceramic sintered compact being an element assembly and terminal electrodes, on a ceramic green body having conductors thereon such that the terminal electrodes are brought into contact with the corresponding conductors; and,

firing the ceramic green body having the chip electronic component so as to integrate the conductors on the ceramic green body with the corresponding terminal electrodes of the chip electronic component by sintering.

2. The method for manufacturing a chip electronic component-mounted ceramic substrate according to Claim 1, wherein the ceramic green body is defined by a ceramic green sheet, and a green ceramic stack formed by stacking the ceramic green sheet having the chip electronic component and other ceramic green sheets is fired.

3. The method for manufacturing a chip electronic component-mounted ceramic substrate according to Claim 2, further comprising the step of forming a constraining layer on the uppermost layer or an internal layer of the green ceramic stack, the constraining layer mainly containing a sintering-resistant powder that is not substantially sintered at the sintering temperature of the ceramic green sheets.

4. The method for manufacturing a chip electronic component-mounted ceramic substrate according to Claim 3, wherein the constraining layer is a sheet containing the sintering-resistant powder and an organic binder.

5. The method for manufacturing a chip electronic component-mounted ceramic substrate according to Claim 4, wherein the sheet of the constraining layer is formed on the uppermost layer of the green ceramic stack, and the method further comprises the step of pressure-bonding the constraining layer to press the chip electronic component into the ceramic green sheet.

6. The method for manufacturing a chip electronic component-mounted ceramic substrate according to Claim 5, wherein the green ceramic stack having the constraining layer is fired with a pressure of 0.1 to 10 MPa applied.

7. The method for manufacturing a chip electronic component-mounted ceramic substrate according to Claim 3, wherein the constraining layer is formed of a green compact of the sintering-resistant powder on the uppermost surface of the green ceramic stack.

8. The method for manufacturing a chip electronic component-mounted ceramic substrate according to Claim 1, further comprising the step of forming a constraining layer in

a sheet form having via conductors arranged corresponding to the terminal electrodes of the chip electronic component, on the ceramic green body to form the conductors, wherein the constraining layer contains a sintering-resistant powder that is not substantially sintered at the sintering temperature of the ceramic green body and an organic binder.

9. The method for manufacturing a chip electronic component-mounted ceramic substrate according to any one of Claims 1 to 8, wherein the chip electronic component is mounted on the conductors of the ceramic green body with an organic adhesive therebetween.

10. The method for manufacturing a chip electronic component-mounted ceramic substrate according to any one of Claims 1 to 9, wherein the ceramic green body is defined by a ceramic green sheet mainly containing a low-temperature co-fired ceramic powder, and the terminal electrodes of the chip electronic component and the conductors on the ceramic green sheet are formed of an electrode material mainly containing silver, copper, or gold.

11. A chip electronic component-mounted ceramic substrate comprising: a ceramic substrate having surface electrodes; and a chip electronic component mounted on the ceramic substrate, the chip electronic component including a ceramic sintered compact as an element assembly and terminal electrodes, wherein the surface electrodes of the ceramic substrate are

integrated with the corresponding terminal electrodes of the chip electronic component by sintering.

12. A chip electronic component-mounted ceramic substrate comprising: a ceramic substrate having surface electrodes; and a chip electronic component mounted on the ceramic substrate, the chip electronic component including a ceramic sintered compact as an element assembly and terminal electrodes, wherein the surface electrodes of the ceramic substrate are connected to the corresponding terminal electrodes of the chip electronic component in a filletless manner without using solder or electroconductive adhesive.

13. The chip electronic component-mounted ceramic substrate according to Claim 11 or 12, wherein the surface electrodes are bump electrodes.

14. The chip electronic component-mounted ceramic substrate according to Claim 11 or 12, wherein at least part of the chip electronic component is embedded in the surface of the ceramic substrate.

15. The chip electronic component-mounted ceramic substrate according to any one of Claims 11 to 14, wherein the ceramic substrate is a multilayer ceramic substrate comprising a plurality of low-temperature co-fired ceramic layers stacked one on top of another, and the terminal electrodes of the chip electronic component and the surface electrodes of the

multilayer ceramic substrate mainly contain silver, copper, or gold.